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What additional details do you want to keep confidential?:

No

If you want part of your response kept confidential, which parts?:**Ofcom may publish a response summary:**

Yes

I confirm that I have read the declaration:

Yes

Additional comments:

Section 1 (Summary)

1.4: "Our assessment is that this is likely to generate greater value for UK citizens and consumers than alternative approaches such as awarding a UK wide licence for individual use of the bands"

CSR Comment/Response:

CSR agrees with this assessment. Independent studies and as well as development in the 2.4

GHz ISM band, with billions of WiFi, Bluetooth, and other technology devices, illustrate the unprecedented value to the economy (and to the individual consumer) that can be realised with unlicensed usage.

Section 2 (Introduction and update)

2.5: "Our 2010 update also re-iterated our invitation to stakeholders to provide additional information and analysis either on technical criteria, or that could help to inform an assessment of the potential value that could be created through particular uses of the bands⁶. We noted that responses to the 2009 consultation had elicited very little information or analysis of this type"

CSR Comment/Response:

CSR believes lack of response does not necessarily equate to a lack of interest.

In regulatory matters, there are differences in engagement strategies and abilities between telecoms operators, who typically retain specialist legal and engineering teams to lobby in support of their long-term interests and to secure a footprint such that they may plan for coverage and deployment, and heterogeneous trade associations comprised of fewer large multinationals and many more smaller companies, including start-ups, especially where unlicensed spectrum usage is mooted.

Resource and economic constraints may force a different strategy, with scarce budget for speculative development where unconfirmed or unclear time bounds preclude accurate return on investment (RoI) and thus may preclude significant spend until such times as a roadmap is available.

If Ofcom proceeds, it would be considered far less speculative to engage and possibly permit a far greater engagement strategy, with concomitant spending constraints released.

2.13: "The Department of Energy and Climate Change (DECC) has said that, as part of broader work to determine the optimal smart meter roll out strategy, they are preparing an outline business case identifying potential public benefits that might be derived from reserving a part of the 870-876 MHz band for the purpose of Home Area Networks (HANs) for smart metering communications. DECC proposed as part of their Smart Metering Equipment Technical Specifications version 2 consultation in autumn 2012 that smart meter deployments be allowed at both the 2.4GHz and 868 MHz (863 - 870 MHz) spectrum. They also asked for stakeholder views on the compatibility and benefits of reserving spectrum at 870-872MHz. DECC are expected to set out their full HAN strategy in part 2 of their response to this consultation in spring this year"

CSR Comment/Response

Considering the relatively small bandwidth requirements for metering data, CSR wonders whether reservation of a part of the band is necessary. DECC refers to data collection such that consumer choice is enhanced when (for example, supplier switching)is considered rather than enabling control of appliances or added services, suggesting bandwidth requirements could be satisfied without the need to reduce the available band for other users.

2.14: "As part of the UK Fire and Rescue Service's (FRS) migration strategy for Breathing Apparatus Telemetry, the FRSs are considering a requirement for a 25 kHz channel in the

band 870-876 MHz. The FRSs are expected to make their spectrum decision in spring this year. We published further information on FRS Breathing Apparatus Telemetry in our Information Memorandum on the award of 800 MHz and 2.6 GHz spectrum¹³"

CSR Comment/Response:

We agree with the conclusions reached in the study .

2.18: "First, the possibility of the MOD releasing the bands 870-872 MHz and 915-917 MHz to Ofcom creates the potential for us to release two blocks of 6 MHz, rather than two blocks of 4 MHz. As well as offering greater capacity, a release of 2x6 MHz could have additional benefits because this would enable UK use to align with the future use by other European countries"

CSR Comment/Response:

CSR agrees strongly with the benefits of releasing two blocks of 6 MHz rather than two blocks of 4 MHz, the possibility of harmonized usage across the European domain provides strong incentive to invest in developing services and solutions to utilise the spectrum.

2.19: "Second, a significant implication of the work that has been undertaken to date by the CEPT is that the options for releasing the spectrum in the UK have been clarified. What these options look like is shown in Annex 5 in figures A5.1 and A5.2. The CEPT's vision for the proposed bands 870-876 MHz and 915-921 MHz helps to visualise where each of the proposed SRD and RFID uses may be implemented if the CEPT's current proposals are adopted; including the technical conditions for co-existence. We consider that this work has now reached a sufficiently advanced stage to enable Ofcom to consult and decide upon the approach to the release of the spectrum. The final CEPT recommendation may affect the contents of a future consultation on, for example, the technical conditions associated with a licence exempt approach"

CSR Comment/Response:

CSR commends Ofcom's efforts to take the lead in enabling this market and providing a path for the European Community to follow. The development of licensed spectrum auctions across Europe in the previous decade and before helped to encourage growth of the nascent mobile communications industries whilst generating significant revenues measured in the £billions for national governments, yet some of the most valuable and important innovations in mobile wireless technology, such as Bluetooth and Wi-Fi, took place in regions of spectrum for which no exclusive licences were issued.

We observe on a daily basis the platform for enabling innovation which unlicensed spectrum usage provides owing to the lower barriers to market entry. Unlicensed spectrum is a proven catalyst for innovation and a strong driving force behind the development of complementary technologies which enhance the effectiveness of devices using licensed spectrum as well as promoting innovative business models.

"The economic value generated by current and future allocations of unlicensed spectrum" Final Report, (Thanki, R., Perspective Associates, 2009) provides conservative estimate of value created by current applications of unlicensed spectrum at \$16-37billion per annum in the U.S.A alone.

2.20: "In particular the progress being made by the CEPT means that there is now a potential

option of releasing the spectrum on licence exempt basis, so enabling a wide range of applications to be used, whilst also retaining the ability to accommodate ER-GSM if that is authorised in the future. Assuming this is the form of the final CEPT recommendation and that other CEPT countries adopt this, there could be additional benefits from the UK aligning with that (especially if 2x6 MHz were available). At the time of our previous (2009) consultation there was insufficient evidence from studies of the compatibility issues and mitigation techniques for a licence exempt option. In addition, the further technical work has clarified that a light licensing option (discussed in our previous consultation) is unlikely to be necessary"

CSR Comment/Response:

CSR supports unlicensed usage based on the value it can create, and on the observation none of the usages appear to require the protection which light licensing would purport to offer, noting too that even light licensing appears to yield far less usage of spectrum in comparison.

2.21: "These developments mean that our assessment of options can now be simplified compared to our earlier consultation. Previously we needed to consider the relative merits of full licensing (including ER-GSM) versus light regulatory approaches (including licence exempt and light licensing). As explained in more detail in section 4, mutually exclusive options for full licensing of ER-GSM and light licensing (eg for RFIDs) are now expected to be unnecessary as these uses can be accommodated with a licence exempt approach. Consequently our assessment can now focus on the likely benefits from a licence exempt approach in line with the direction of CEPT (on the basis that this would retain the ability for a licensed ER-GSM deployment) and considering whether there are any credible alternative approaches to releasing the spectrum which would be likely to create greater value"

CSR Comment/Response:

CSR believes there exists good reason to expect we are at the beginning of a "personal wireless" era and cannot yet fully appreciate the extent of possible use cases which can be enabled (for example, personal health, where significant potential for use cases such as chronic disease management, independence of the elderly, keep-fit, recovery and convalescence)

Per "The Case For Unlicensed Spectrum" (Milgrom, Paul, Levin, Jonathan, Eilat, Assaf, October 12, 2011):

"...even when innovations are hard to predict, one often can identify resources that facilitate innovation. It would have been hard to conceive iPhone apps before the iPhone, or the many uses of the internet before the internet, or the value of web browsers before the development of search engines and commercial websites, etc. Each was an enabling technology that created vast opportunities for innovation. Unlicensed spectrum has shown itself to be a similar type of building block without which such technologies as Wi-Fi and Bluetooth may have not been developed, and without which the markets for devices and apps would be severely limited"

Section 3 (Technical information about use of the spectrum)

3.4: "Concerns were raised about the technical conditions and mitigation techniques associated with the option of licensing the 872-876 MHz and 917-921 MHz bands and protection to wideband mobile services such as UMTS in the band 880-915 MHz paired with

925-960 MHz previously reserved for GSM services. A number of responses argued that further analysis was required to assess the potential interference, coexistence and coordination problems and how these translated into real-life scenarios; the technical assumptions in relation to power limits and separation distances, the varying mitigation techniques that could be employed to reduce (interferer-to-victim) separation distances further and, as we said in our 2009 consultation (see paragraph 5.45), demonstrate that it is possible for the licence exempt services to co-exist together and with services in adjacent bands if licence exemption is to be considered"

CSR Comment/Response:
CSR agrees with the assessment.

Section 4 (Assessment of approach to releasing the spectrum)

4.8 "We expect that a licence exempt approach will have the following characteristics (also see Annex 5, figure A5.2):

- i) Technical conditions which enable the widest range of SRD applications, including smart metering;
- ii) RFID use in the upper band;
- iii) Sufficient restrictions on power and duty cycles to avoid imposing costs to adjacent cellular services; and
- iv) The ability to co-exist with ER-GSM (in 873-876 MHz and 918-921 MHz bands) if that is licensed in the future."

CSR Comment/Response:
We suggest an editorial note to (ii) to read "coexistence with RFID use in the upper band"

4.14: "In addition, there will be greater application neutrality in 870-876 MHz and 915-921 MHz, based on the principles set out in ECC Report 181: different applications will not be tied to specific channels, with the result that individual devices will have access to a wider bandwidth than at present. This greater flexibility could allow greater opportunities for innovation in the use of SRDs than is currently possible"

CSR Comment/Response:
CSR agree with the proposals. It is unclear which usages will prove most popular in time and believe pre-allocation of channels would present an unwelcome restriction, preferring instead to advocate the use of non-specific SRD's. Further to this, the availability of the entire spectrum to such devices would suggest the usage be protected by methods to mitigate inter-device interference, enhancing system robustness.

4.30: "Fully Licensed: This approach would award an individual licence, probably national in scope, to use the spectrum at a higher power level than permitted by licence exemption. To protect neighbouring bands however, relatively stringent power restrictions would still apply. We would expect to award this via an auction, in accordance with our general policy of making use of market mechanisms³⁸"

CSR Comment/Response:
CSR does not support this proposal, referring to previous responses on the benefits to the consumer and indeed to licensed devices, where unlicensed spectrum has fostered and promoted growth in areas not easily forecast initially (a consequence of enabling innovation

and the emergence of ever new business models), in addition to expanding market potential in existing use cases.

4.13: "Applications: Previously we considered a main candidate to be ER-GSM under this approach on based on the assumption that its co-existence with licence exempt use was unlikely³⁹. Our current view, however, is that co-existence is feasible. We also noted that a TETRA based network might be built, but given the absence of expressed interest we now see this as unlikely"

CSR Comment/Response:

Based on the belief the single deterministic aspect of the future is that it will be different; new ideas give rise to new usages not originally considered. CSR advocate strongly the creation of a rule set which neither requires nor assumes a particular technology or application.

4.36: "We recognise that there is some uncertainty about whether some of these potential uses, such as ER-GSM or smart metering, will materialise and about the scale and value of use by other applications such as SRD and RFID. However, overall we consider that a licence exempt approach offers substantial scope for this spectrum to be put to valuable use. As regards the alternative uses we have considered, full licensing appears unlikely to be practical and we consider that there is no longer a case for a light licensing approach"

CSR Comment/Response:

CSR agrees with the consideration of the license exempt approach, as previously stated. The avoidance of specification on spectrum usage for particular technologies or applications is key to enabling innovation to occur as well as increasing the usage of that spectrum.

Question 1: What other developments, in addition to the international and public sector developments we have identified, are relevant to our identification and assessment of options for release? :

CSR supports the specific inclusion of Spread Spectrum technologies, and see significant potential particularly in low power, long range and low data rate applications.

Question 2: Do you have any additional information or analyses that could help to inform our assessment of the value that could be created through different uses of the spectrum?:

CSR has no further information on this subject.

Question 3: Do you agree with our proposal to release 870-876 MHz / 915 -921 MHz for licence exempt SRD and RFID applications if Government releases 870-872 MHz / 915-917 MHz? :

CSR agrees with the proposal

Question 4: Do you agree with our proposal to release 872-876 MHz / 917-921 MHz for licence exempt SRD and RFID applications if Government does not release 870-872 MHz / 915-917 MHz? :

CSR agrees with the proposal

Question 5: Do you have a view on the sequencing and timing of Ofcom's next steps if the spectrum is released for licence exempt SRD and RFID applications?:

CSR commends the initiative shown by Ofcom and we look forward to the next steps